

WHAT IS CLAIMED IS:

- 1 1. A fuel cartridge comprising:
2 a housing ;
3 a fuel egress port supported by the housing; and
4 a heat producing element disposed in thermal communication with an interior portion
5 of the housing.

- 1 2. The fuel cartridge of claim 1 further comprising: and
2 a surface area enhanced planar vaporization membrane residing in the fuel cartridge,
3 the surface area enhanced planar vaporization membrane disposed in thermal communication
4 with the heat producing element.

- 1 3. The fuel cartridge of claim 1 wherein the surface area enhanced planar
2 vaporization membrane is disposed about a substantial portion of an interior perimeter of the
3 housing to provide a high surface area membrane
- 4 4. The fuel cartridge of claim 1 wherein the surface area enhanced planar
5 vaporization membrane is a composite membrane comprised of multiple layers or folds of
6 polymer membrane to increase vapor permeation surface area.

- 1 5. The fuel cartridge of claim 1 wherein the surface area enhanced planar
2 vaporization membrane is a membrane arranged as a series of folds.

- 1 6. The fuel cartridge of claim 1 wherein the surface area enhanced planar
2 vaporization membrane is a polymer membrane provided with macroscopically irregular
3 and/or microscopically roughened membrane surfaces to increase the effective membrane
4 surface area for pre-evaporation.

- 1 7. The fuel cartridge of claim 1 wherein the heating element is disposed within
2 the housing adjacent the surface area enhanced planar vaporization membrane that spaces a
3 liquid source of hydrogen containing compound or carbonaceous fuel from a vapor phase of
4 the source of hydrogen containing compound or carbonaceous fuel.

1 8. The fuel cartridge of claim 1 wherein the cartridge supplies a source of fuel to
2 a direct methanol fuel cell, and the fuel cartridge contains a liquid source of hydrogen
3 containing compound or carbonaceous fuel.

1 9. The fuel cartridge of claim 1 wherein the heating element is a wire disposed in
2 thermal communication with the interior of the cartridge.

1 10. The fuel cartridge of claim 1 wherein the heating element is a wire disposed in
2 the interior of the cartridge.

1 11. The fuel cartridge of claim 1 wherein the heating element in the interior of the
2 cartridge and spaces a vapor portion of the cartridge from a liquid reservoir of the cartridge.

1 12. A fuel cartridge, comprising:
2 a housing ;
3 a fuel egress port supported by the housing;
° 4 a bladder for containing a source of fuel; and
5 a piston that is urged against the bladder.

1 13. The fuel cartridge of claim 12 further comprising a heat producing element
2 disposed in thermal communication with an interior portion of the housing.

1 14. The fuel cartridge of claim 11 further comprising a spring mechanism
2 disposed to urge the piston against the bladder.

1 15. The fuel cartridge of claim 13 further comprising a battery cell disposed to
2 supply power to the heat-producing element.

1 16. The fuel cartridge of claim 12 wherein fuel cartridge is a prismatic shaped
2 cartridge.

1 17. The fuel cartridge of claim 12 wherein the source of fuel in the bladder is
2 methanol.

1 18. A fuel cartridge, comprising:
2 a housing ;
3 a vaporization membrane;
4 a fuel egress port supported by the housing; and
5 a piston that is urged against the vaporization membrane, with the vaporization
6 membrane providing a chamber in the fuel cartridge in vapor communication with the fuel
7 cell anode.

1 19. The fuel cartridge of claim 18 further comprising a spring mechanism
2 disposed to urge the piston against the membrane.

1 20. A fuel cartridge, comprising:
2 an inner housing having a opening to allow vapor to escape;
3 a vaporization membrane;
4 a piston that is urged against the vaporization membrane, with the vaporization
5 membrane providing a chamber in the inner housing in vapor communication with the
6 opening; and
7 an outer housing disposed around at least a portion of the inner housing, forming an
8 outer chamber about the inner housing, with the outer chamber being in vapor
9 communication with the chamber in the inner housing.

1 21. The fuel cartridge of claim 20 further comprising a vapor impermeable
2 member disposed to terminate the outer chamber.

1 22. The fuel cartridge of claim 18 further comprising a spring mechanism
2 disposed to urge the vapor impermeable member against a liquid fuel in the inner housing.